

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

| | |
|--|--|
| Date of mailing (day/month/year) 28 May 2001 (28.05.01) | |
| International application No. PCT/SE00/01751 | Applicant's or agent's file reference 940/PCT |
| International filing date (day/month/year) 11 September 2000 (11.09.00) | Priority date (day/month/year) 15 September 1999 (15.09.99) |
| Applicant GUNNARSSON, Cenneth | |

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

04 April 2001 (04.04.01)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

BEST AVAILABLE COPY

| | |
|---|---------------------------------------|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland | Authorized officer Charlotte ENGER |
| Facsimile No.: (41-22) 740.14.35 | Telephone No.: (41-22) 338.83.38 |

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF RECEIPT OF
RECORD COPY

(PCT Rule 24.2(a))

To:

WALLENGREN, Yngvar
Patentbyrå Y Wallengren AB
Box 116
S-331 21 Värnamo
SUÈDE

| | |
|---|---|
| Date of mailing (day/month/year) 06 November 2000 (06.11.00) | IMPORTANT NOTIFICATION |
| Applicant's or agent's file reference 940/PCT | International application No. PCT/SE00/01751 |

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

C. GUNNARSSONS VERKSTADS AB (for all designated States except US)
GUNNARSSON, Cenneth (for US)

International filing date : 11 September 2000 (11.09.00)

Priority date(s) claimed : 15 September 1999 (15.09.99)

Date of receipt of the record copy
by the International Bureau : 17 October 2000 (17.10.00)

List of designated Offices :

AP : GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW

ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

☒ time limits for entry into the national phase

☐ confirmation of precautionary designations

☒ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

| | |
|---|---|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland | Authorized officer: Catherine Massetti |
| Facsimile No. (41-22) 740.14.35 | Telephone No. (41-22) 338.83.38 |

INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. **It is the applicant's responsibility** to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

PATENT COOPERATION TREATY

PCT

ANIKOM

2000-12-18

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

WALLENGREN, Yngvar
Patentbyrå Y Wallengren AB
Box 116
S-331 21 Värnamo
SUÈDE

| | |
|--|--|
| Date of mailing (day/month/year) 08 December 2000 (08.12.00) | |
| Applicant's or agent's file reference 940/PCT | IMPORTANT NOTIFICATION |
| International application No. PCT/SE00/01751 | International filing date (day/month/year) 11 September 2000 (11.09.00) |
| International publication date (day/month/year) Not yet published | Priority date (day/month/year) 15 September 1999 (15.09.99) |
| Applicant C. GUNNARSSONS VERKSTADS AB et al | |

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

| <u>Priority date</u> | <u>Priority application No.</u> | <u>Country or regional Office or PCT receiving Office</u> | <u>Date of receipt of priority document</u> |
|-------------------------|---------------------------------|---|---|
| 15 Sept 1999 (15.09.99) | 9903274-0 | SE | 30 Nove 2000 (30.11.00) |

| | |
|--|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35 | Authorized officer Tessadel PAMPLIEGA <i>Tap</i> Telephone No. (41-22) 338.83.38 |
|--|--|

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| | | | |
|--|---|---|---|
| Applicant's or agent's file reference 940/PCT | FOR FURTHER ACTION | | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
| International application No. PCT/SE00/01751 | International filing date (<i>day/month/year</i>) 11.09.2000 | Priority date (<i>day/month/year</i>) 15.09.1999 | |
| International Patent Classification (IPC) or national classification and IPC ₇ B07C 5/14 | | | |
| Applicant C Gunnarssons Verkstads AB et al | | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

| | |
|--|---|
| Date of submission of the demand 04.04.2001 | Date of completion of this report 29.08.2001 |
| Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88 | Authorized officer Åke Olofsson / JA A Telephone No. 08-782 25 00 |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01751

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language english which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE00/01751

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------------|-----|
| Novelty (N) | Claims | <u>1-6</u> | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | <u>1-6</u> | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | <u>1-6</u> | YES |
| | Claims | | NO |

2. Citations and explanations (Rule 70.7)

The documents cited in the International Search Report represent the prior art. The claimed invention stated in claims 1-6 is not considered to be anticipated by these documents. None of the documents or any relevant combination of them reveal a feeder arrangement for the individual feeding of timber pieces to a downwardly moving conveyor includes an incoming conveyor and projecting carriers on the downwardly moving conveyor as described by these claims.

According to the arguments stated above, the invention claimed in claims 1-6 is novel, considered to involve an inventive step and have industrial applicability.

RECORD COPY

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

PCT/SE 00 / 0 1 7 5 1
International Application No.11-09-2000
International Filing DateThe Swedish Patent Office
PCT International Application

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) 940/PCT

Box No. I TITLE OF INVENTION

Feeding arrangement for individual feeding of timber pieces.

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

RO/SE
C. Gunnarssons Verkstads AB
Olvägen
SE-8-340 30 VISLANDA
Sweden

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:
SEState (that is, country) of residence:
SEThis person is applicant
for the purposes of:☐ all designated
States☒ all designated States except
the United States of America☐ the United States
of America only☐ the States indicated in
the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

GUNNARSSON, Cenneth
Växjövägen
SE-8-340 30 VISLANDA
Sweden

This person is:

☐ applicant only☒ applicant and inventor☐ inventor only (If this check-box
is marked, do not fill in below.)State (that is, country) of nationality:
SEState (that is, country) of residence:
SEThis person is applicant
for the purposes of:☐ all designated
States☐ all designated States except
the United States of America☒ the United States
of America only☐ the States indicated in
the Supplemental Box☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby ~~has been~~ appointed to act on behalf
of the applicant(s) before the competent International Authorities as:

☒ agent☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

WALLENGREN, Yngvar/NILSSON, Camilla/IMMONEN, Maria
Patentbyrå Y Wallengren AB
Box 116
SE-8-331 21 VÄRNAMO
Sweden

Telephone No.

+46-370 15515

Facsimile No.

+46-370 12846

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

B x No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LC Saint Lucia |
| <input checked="" type="checkbox"/> AG Antigua and Barbuda | <input checked="" type="checkbox"/> LK Sri Lanka |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MA Morocco |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BZ Belize | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> MZ Mozambique |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CR Costa Rica | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany and Utility Model | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DM Dominica | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> DZ Algeria | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |

Check-box reserved for designating States which have become party to the PCT after issuance of this sheet:



Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

1.1 -09- 2000

| Box No. VI PRIORITY CLAIM | | <input type="checkbox"/> Further priority claims are indicated in the Supplemental Box. | | |
|---|----------------------------------|---|--|--|
| Filing date of earlier application (day/month/year) | Number of earlier application | Where earlier application is: | | |
| | | national application: country | regional application: regional Office | international application: receiving Office |
| item (1) 15 September 1999 | 9903274-0 | SE | | |
| item (2) | | | | |
| item (3) | | | | |

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): 1

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

| | | | |
|--|--|--|-------------------------------------|
| Box No. VII INTERNATIONAL SEARCHING AUTHORITY | | | |
| Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): | | Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority): | |
| ISA/ SE | | Date (day/month/year) | Number Country (or regional Office) |
| | | 15 September 1999 | SE 99/01222 SE |

| | |
|--|--|
| Box No. VIII CHECK LIST; LANGUAGE OF FILING | |
| This international application contains the following number of sheets: request : 3 ✓ description (excluding sequence listing part) : 6 ✓ claims : 1 ✓ abstract : 1 ✓ drawings : 2 ✓ sequence listing part of description : Total number of sheets : 13 ✓ | This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): ITS-report |
| Figure of the drawings which should accompany the abstract: 2 | Language of filing of the international application: Swedish |

| | |
|--|--|
| Box No. IX SIGNATURE OF APPLICANT OR AGENT | |
| Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request). | |
| Värnamo 7 September 2000 Yngvar Wallengren | |

| | | |
|---|--|---|
| For receiving Office use only | | 2. Drawings: <input checked="" type="checkbox"/> received: <input type="checkbox"/> not received: |
| 1. Date of actual receipt of the purported international application: | 11 -09- 2000 | |
| 3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application: | | |
| 4. Date of timely receipt of the required corrections under PCT Article 11(2): | | |
| 5. International Searching Authority (if two or more are competent): ISA/ SE | 6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid. | |

| | |
|---|-------------|
| For International Bureau use only | |
| Date of receipt of the record copy by the International Bureau: | 17 OCT 2000 |

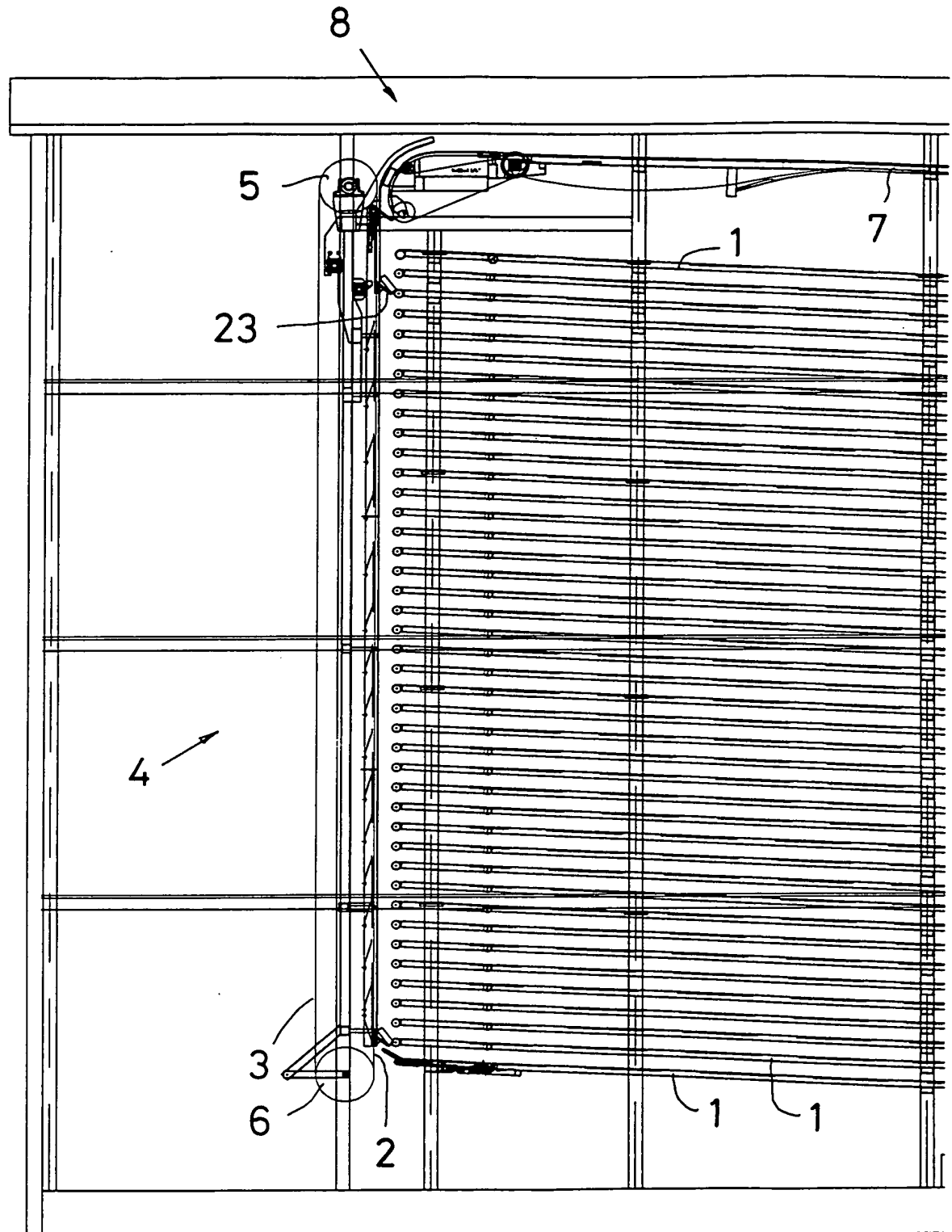


Fig 1

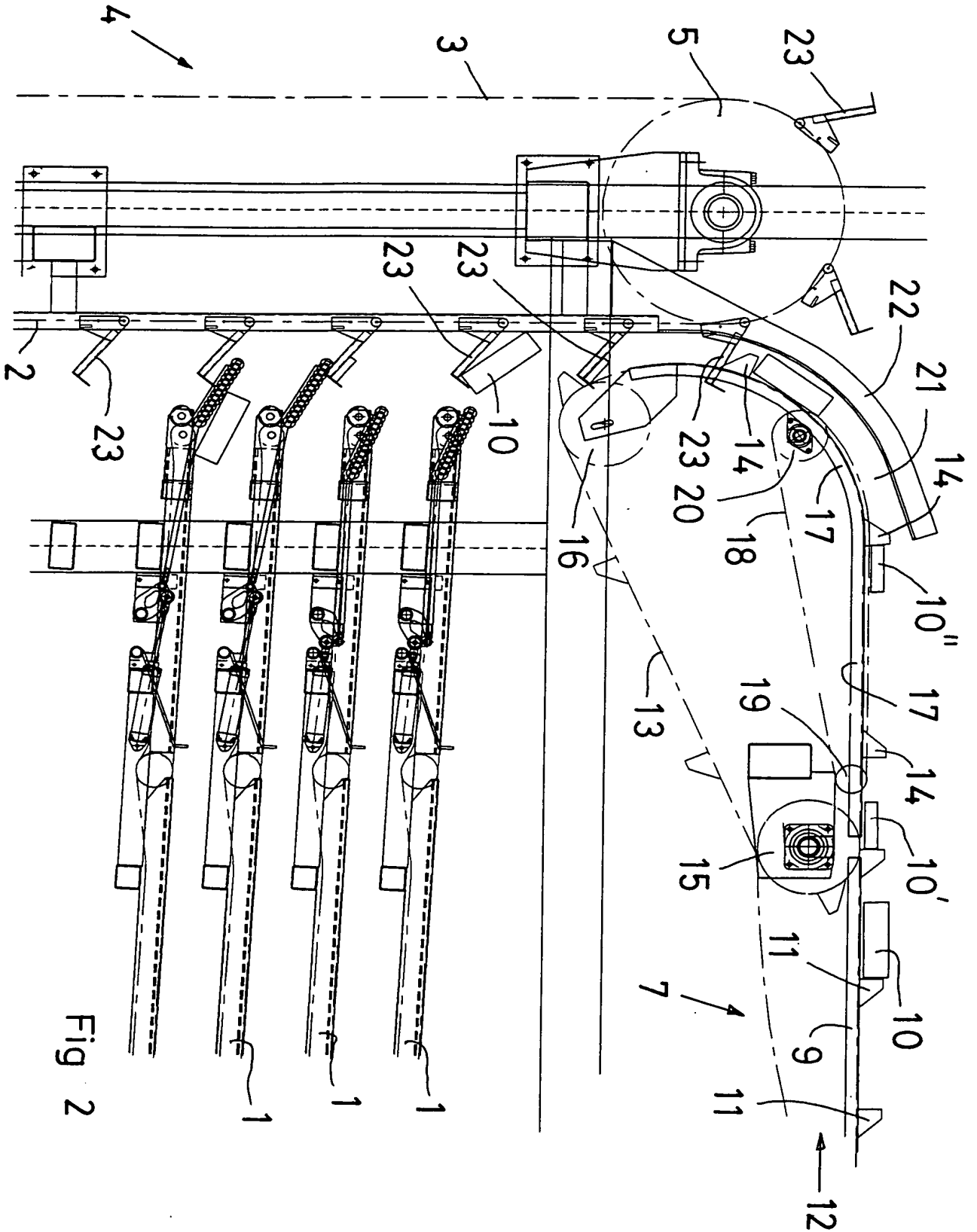


Fig 2

MATNINGSANORDNING FÖR STYCKVIS MATNING AV VIRKESSTYCKEN

TEKNISKT OMRÅDE

5

Den föreliggande uppfinningen avser en matningsanordning för styckvis matning av virkesstycken till en nedåtgående transportör och innefattar en inkommande transportör för tillförsel av virkesstycken och utskjutande bärare på den nedåtgående transportören.

10

ÄLDRE TEKNIK

15

Uppfinningen är avsedd att tillämpas i en anläggning för insortering av enskilda virkesstycken av olika dimensioner och/eller kvaliteter i ett antal över varandra belägna insorteringsfack.

20

I tidigare kända anläggningar av den ovan nämnda typen representeras de enskilda insorteringsfacken av ungefärligen horisontella transportörer med en betydande längd i storleksordningen 50-100 m eller eventuellt mer. Dessa transportörer är anordnade över varandra med ungefärligen 30-40 cm delning. Antalet insorteringsfack i höjdlid kan vara stort, ofta 30-50 stycken.

25

Längs inmatningsändarna till sorteringsfacken löper en nedåtgående transportör, som transporterar de enskilda virkesstyckena fram till ett visst, förutbestämt insorteringsfack där virkesstycket avges medelst en överföringsanordning och tillföres det utvalda insorteringsfacket.

30

Tidigare kända anläggningar har lidit av alltför låg kapacitet, eftersom överföringen av det enskilda virkesstycket från den nedåtgående transportören till resp insorteringsfack tagit allför lång tid.

35

För att försöka öka anläggningens kapacitet har man ökat den tid, som finns tillgänglig för inmatning av varje enskilt virkesstycke i ett speciellt insorteringsfack. Detta har åstadkommits genom en ökning av den linjära transportlängden för varje virkesstycke på den nedåtgående transportören från det översta insorteringsfacket till det understa. För att uppnå detta har man lagt den nedåtgående transportören lutande genom att de enskilda insorteringsfacken inte börjar i ett vertikalplan utan ett plan som lutar mot vertikalen.

40

Detta har åstadkommits genom att ett övre insorteringsfack sträcker sig ut utanför ett underliggande insorteringsfack. Den nedåtgående transportören

följer inmatningsändarna till insorteringsfacken och har en betydande lutning i förhållande till ett vertikalplan.

5 Den nedåtgående transportören har ett antal kedjor på vilka virkesstyckena ligger platt med virkesstyckenas längdriktning ungefär vinkelrät mot kedjornas rörelseriktning. Detta innebär att virkesstyckena lutar på samma sätt som kedjorna, varför virkesstyckenas, i rörelseriktningen främre kanter hela tiden befinner sig på en lägre nivå än deras bakre kanter. Denna lutning hos virkesstyckena är mycket fördelaktig eller t o m nödvändig, när virkesstyckena skall
10 överföras från den nedåtgående transportören till resp insorteringsfack.

För tillförsel av de enskilda virkesstyckena till den nedåtgående, lutande transportören har man använt en transportör som rör sig ungefärligen horisontellt och i samma riktning som den nedåtgående transportörer. Överfö-
15 örningen mellan dessa båda transportörer har kunnat ske på ett ganska enkelt sätt.

Det ovan beskrivna arrangemanget med insorteringsfack, där ett övre insorteringsfack med ett ändparti sträcker sig utanför änden på ett därunder beläget
20 insorteringsfack innebär att längden för det understa och kortaste insorteringsfacket bestäms av kraven på anläggningens kapacitet och att därför alla däröver belägna insorteringsfack i princip blir onödigt långa och kostsamma och där de översta insorteringsfacken blir mycket för långa.

25 Som ett försök att eliminera behovet av dessa överdrivet långa insorteringsfack vill man lägga inmatningsändarna till insorteringsfacken och den nedåtgående transportören i med varandra parallella lodplan. Detta kräver att den nedåtgående transportören är försedd med utskjutande, bärare vilka vardera skall uppbära ett enda virkesstycke. Den tidigare kända tekniken att mata den
30 nedåtgående transportören kan inte användas i en sådan konfiguration.

PROBLEMSTÄLLNING

Den föreliggande uppfinningen har till ändamål att så utforma den inledningsvis antydda matningsanordningen att den med hög kapacitet kan mata en
35 i huvudsak lodrät, nedåt gående transportör med utskjutande bärare, samtidigt som de av bärarna uppburna virkesstyckena kan ges en orientering, som är gynnsam, när virkesstyckena sedan överföres till resp insorteringsfack. Speciellt avser uppfinningen att så utforma uppfinningsföremålet att detta ger en
40 mycket hög arbetstakt och god driftssäkerhet.

PROBLEMLÖSNING

Den till grund för uppfinningen liggande målsättningen uppnås om bäarna
lutar snett nedåt i riktning ut från den nedåtgående transportören, att ett krökt,
5 av styrskenor begränsat styrutrymme är anordnat att med ett nedre slutparti
överlappa med ett övre parti av den nedåtgående transportören och att styr-
utrymmets krökningsvinkel är så stor att ovansidan på ett till styrutrymmet
kommande virkesstycke blir vänd nedåt, när virkesstycket vilar på en bärare.

10 SAMMANSTÄLLNING ÖVER RITNINGSGIFURER

Uppfinningen skall nu beskrivas närmare under hänvisning till bifogade
ritningar. På dessa visar:

- 15 fig 1 en vertikal sidovy av inmatningsändarna till ett arrangemang med över
varandra anordnade insorteringsfack där matningsanordningen enligt
uppfinningen befinner sig över det översta insorteringsfacket,
- 20 fig 2 en vertikal sidovy av uppfinningsföremålet i anslutning till inmat-
ningsändarna av de översta insorteringsfacken.

FÖREDRAGEN UTFÖRINGSFORM

Fig 1 visar en vertikal sidovy över ena änden av en anläggning för sortering
25 av virke, så att virket efter sorteringen blir ordnat efter virkesdimension och
kvalitet. Anläggningen är uppbyggd i en bärande konstruktion av stål balkar
och har i den visade utföringsformen en höjd på ca 20 m. Anläggningen inne-
fattar ett antal insorteringsfack, ett för varje virkesdimension och kvalitet eller
möjligen ett för varje intervall av dimensioner eller kvaliteter. Insorterings-
30 facken är arrangerade över varandra med en delning i höjddled på 30-40 cm.
Varje insorteringsfack innefattar ett antal på samma höjd och parallellt med
varandra anordnade transportörer, vilka uppbär virkesstyckena, som ligger
endast i ett skikt på varje insorteringsfack och som har sina längdriktningar
horisontella och vinkelräta mot transportörernas och insorteringsfackens
35 längdriktningar, dvs vinkelrätt mot ritningens plan i fig 1.

I fig 1 avser hänvisningsbeteckningen 1 de ovan nämnda insorteringsfacken
medan hänvisningsbeteckningen 2 avser en nedåtgående part i en i höjddled
löpande transportör medan hänvisningsbeteckningen 3 avser en uppåtgående
40 part i nämnda transportörer. Transportören, som lämpligen kan vara i huvud-

sak vertikal, har i sin helhet hänvisningsbeteckningen 4 och löper över ett övre brythjul 5 och ett undre brythjul 6.

- 5 Den vertikala transportörer bär virkesstyckena uppifrån och nedåt för inmatning av dessa i ett speciellt insorteringsfack 1. För tillförsel av virkesstycken till den vertikala transportörer har anläggningen en inkommande transportör 7, vilken är i huvudsak horisontell och vilken bär virkesstyckena horisontella med längdriktningen vinkelrätt mot transportörens 7 rörelseriktning och alltså vinkelrätt mot papperets plan i fig 1.
- 10 För överföring av de på den inkommande transportören 7 burna virkesstyckena har uppfinningsföremålet en matningsanordning, som i sin helhet betecknas med 8.
- 15 Fig 2 visar i större skala matningsanordningen 8 tillsammans med ett övre parti av den vertikala transportören 4 och de fyra översta insorteringsfacken 1.
- 20 Den inkommande transportören 7 har åtminstone ett mot matningsanordningen 8 vänt ändparti, som är i huvudsak horisontellt. Den inkommande transportören 7 innefattar bärande skenor 9, på vilka virkesstyckena 10 glider. Vidare innefattar den inkommande transportören 7 drivkedjor, band eller liknande vilka är försedda med medbringare 11, som framför sig skjuter de enskilda virkesstyckena 10. Den inkommande transportören 7 matar virkesstyckena 10 i riktning åt vänster i ritningen enligt pilen 12.
- 25 I området mellan utmatningsänden för den inkommande transportören 7 och den övre änden av den vertikala transportören 4 är det anordnat en synkroniseringstransportör 13 med stopporgan 14, vilka hindrar enskilda virkesstycken att röra sig åt vänster och nedåt med en hastighet som är större än hastigheten hos synkroniseringstransportören 13. Synkroniseringstransportören löper synkront med den vertikala transportören 4 i den meningen, att ett stopporgan 14 alltid rörelsemässigt skall passa samman med en bärare 23 på den vertikala transportören 4 (vilket skall beskrivas närmre nedan). I figuren framgår tydligt hur virkesstyckena 10 med sina i rörelseriktningen främre kanter anligger
- 30 mot stopporganen 14. Det framgår vidare att ett övre område av den nedåtgående parten 2 i den vertikala transportören 4 överlappar med ett nedre parti av synkroniseringstransportören 13 och det är i detta område som rörelserna hos stopporganen 14 och bärarna 23 skall passa samman.
- 35
- 40 Synkroniseringstransportörens 13 bana är bestämd av de båda brythjulen 15 och 16 samt av en styrskena 17, vilken har ett rakt och ungefärligen horison-

tellt parti vänt mot den ingående transportören 7 och ett välvt nedåtgående parti, som är riktat mot den vertikala transportören 4 och som överlappar delvis med denna. Det välvda partiet har ungefärligen formen av en cirkelbåge med en utsträckning i omkretsriktningen på ca 90° eller något mer.

5

För att överföra de enskilda virkesstyckena 10 från de lägen de har när de lämnar den inkommande transportören 7 till de lägen de har när de med sina främre kanter anliggar mot stopporganen 14 på synkroniseringstransportören 13 innefattar uppfinningsföremålet en drivanordning med ett kretsande band 18, en kedja eller liknande. Bandet 18 löper över de båda brythjulen 19 och 20 och befinner sig med sin övre part något ovanför ovanytan på styrskenan 17 så att virkesstyckena genom friktionssamverkan med bandet 18 drives fram av detta. Bandet 18 löper med större linjär hastighet än vad som gäller för synkroniseringstransportören 13 så att virkesstycket 10' längs den horisontella delen av styrskenan 17 accelereras till ett läge som motsvarar virkesstycket 10" där det sedan följer stopporganet 14 med den hastighet, som definieras av synkroniseringstransportören.

På utsidan av styrskenan 17 finns ett styrutrymme 21, genom vilket virkesstyckena passerar. Styrutrymmet 21 är utåt och uppåt begränsat av en yttre styrskena 22, vilken åtminstone till en del av sin, ca ett kvarts varv, längd löper ungefärligen parallellt med det krökta partiet av den inre styrskenan 17. Av figuren framgår tydligt hur de enskilda på den vertikala transportören 4 anordnade bärarna 23 sträcker sig rakt igenom styrutrymmet 21.

25

Den yttre styrskenan 22 har ett nedre ändparti, som kan ses som en förlängning uppåt av den vertikala transportören 4.

Såsom nämndes ovan har den inre styrskenan 17 en utsträckning, som företrädesvis något överstiger 90°. Detta innebär, att om styrskenans 17 övre, raka parti är horisontellt, så kommer dess undre ände (utmatningsändan) att något divergera bort från den vertikala transportören 4 i riktning nedåt. Mellan det undre ändpartiet av den inre styrskenan 17 och den vertikala transportören 4 får därför styrutrymmet 21 ett nedåt sig kilformigt vidgande parti, som nedåt är begränsat av en därigenom passerande bärare 23. Det är i detta område som avläggningen av ett virkesstycke från ett stopporgan 14 till en bärare 23 slutföres.

Av figuren framgår vidare att bärarna 23 lutar snett nedåt i riktning ut från den nedåtgående parten 2 i den vertikala transportören 4. Härigenom kommer bärarna 23 ungefärligen att bilda tangent till krökningskurvan för styrutrym-

40

met 21 när bäraren lämnar styrutrymmet. Krökningen för styrutrymmet 21 är så stor att ovansidan på ett virkesstycke, som tillförs styrskenan 17 blir vänd nedåt när samma virkesstycke vilar på en bärare 23.

- 5 Ovan nämndes att synkroniseringstransportören 13 i en mening löpte synkront med den vertikala transportören 4. Emellertid har synkroniseringstransportören 13 större linjär rörelsehastighet än bärarna 23. Vidare är avstånden mellan närbelägna stopporgan 14 större än mellan närbelägna bärare 23. Synkroniseringen ligger däri att ett virkesstycke, vars läge i styrutrymmet 21
- 10 är definierat av ett stopporgan 14, skall komma i beröring med en i styrutrymmet befintlig bärare 23, vid samma position i styrutrymmet, nämligen ungefärligen där styrutrymmets bredd börjar öka i riktning nedåt. Vidare skall styrorganet 14 helt hunnit förbi bäraren 23, så att virkesstycket helt vilar på bäraren, när denna lämnar styrutrymmet och stopporganet 14 börjar vinklas
- 15 bort vid bärhjulet 16.

PATENTKRAV

1. Matningsanordning för styckvis matning av virkesstycken (10) till en ned-
åtgående transportör (2) innefattande en inkommande transportör (7) för till-
5 försel av virkesstycken och utskjutande bärare (23) på den nedåtgående trans-
portören, k ä n n e t e c k n a d därav, att bärarna (23) lutar snett nedåt i rikt-
ning ut från den nedåtgående transportören (2), att ett krökt, av styrskenor
(17, 22) begränsat styrutrymme (21) är anordnat att med ett nedre slutparti
10 överlappa med ett övre parti av den nedåtgående transportören (2) och att
styrutrymmets krökningsvinkel är så stor att ovansidan på ett till styrutrymmet
kommande virkesstycke (10) blir vänd nedåt när virkesstycket vilar på en
bärare.
2. Matningsanordning enligt kravet 1, k ä n n e t e c k n a d därav, att den
15 inkommande transportören (7) har ett mot styrutrymmet (21) vänt ändparti,
som är ungefärligen horisontellt och att styrutrymmet har en krökningsvinkel
nedåt, som är ca 90° eller större.
3. Matningsanordning enligt kravet 1 eller 2, k ä n n e t e c k n a d av en
20 synkroniseringstransportör (13), vilken sträcker sig från den inkommande
transportörens (7) utmatningsände och genom styrutrymmet (21), varvid syn-
kroniseringstransportören har stopporgan (14), mot vilka virkesstyckenas (10)
i rörelseriktningen främre kanter anligger.
4. Matningsanordning enligt kravet 3, k ä n n e t e c k n a d därav, att en
25 drivanordning (18) är anordnad utefter åtminstone en del av synkroniserings-
transportörens (13) bana, varvid drivanordningen är anordnad att påverka
virkesstyckena (10) med en hastighet, som är större än synkroniserings-
transportörens hastighet.
- 30 5. Matningsanordning enligt något av kraven 1-4, k ä n n e t e c k n a d
därav, att bärarna (23) har en längdriktning, som ungefärligen bildar tangent
till styrutrymmets (21) krökningsbana, när bäraren lämnar styrutrymmet.
6. Matningsanordning enligt kravet 4 eller 5, k ä n n e t e c k n a d därav, att
35 drivanordningen (18) innefattar ett kretsande band, på vilket virkesstyckena
(10) vilar.

SAMMANDRAG

En matningsanordning för styckvis matning av virkesstycken (10) till en ned-
åtgående transportör (2) innefattar en inkommande transportör (7) och ut-
5 skjutande bärare (23) på den nedåtgående transportören (2). Den inkommande
transportören (7) är anordnad för tillförsel av virkesstycken (10). Bärarna (23)
lutar snett nedåt och utåt från den nedåtgående transportören (2). Ett krökt
styrutrymme (21) är anordnat att med ett nedre slutparti överlappa ett övre
10 parti av den nedåtgående transportören (2). Styrutrymmets (21) kröknings-
vinkel är så stor att ovansidan av ett virkesstycke (10), som kommer till styr-
utrymmet (21), blir nedåtvänd när virkesstycket (10) vilar på en bärare (23).
Den inkommande transportören (7) har ett ändparti, som är vänt mot styr-
utrymmet (21), och som är ungefärligen horisontellt.

15

Fig 2

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
22 March 2001 (22.03.2001)

PCT

(10) International Publication Number
WO 01/19538 A1

(51) International Patent Classification⁷: B07C 5/14

(21) International Application Number: PCT/SE00/01751

(22) International Filing Date:
11 September 2000 (11.09.2000)

(25) Filing Language: Swedish

(26) Publication Language: English

(30) Priority Data:
9903274-0 15 September 1999 (15.09.1999) SE

(71) Applicant (for all designated States except US): C. GUN-
NARSSONS VERKSTADS AB [SE/SE]; Olvågen, S-340
30 Vislanda (SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): GUNNARSSON,
Cenneth [SE/SE]; Växjövägen, S-340 30 Vislanda (SE).

(74) Agents: WALLENGREN, Yngvar et al.; Patentbyrå Y
Wallengren AB, Box 116, S-331 21 Värnamo (SE).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DE (utility model), DK, DM, DZ, EE, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,
SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU,
ZA, ZW.

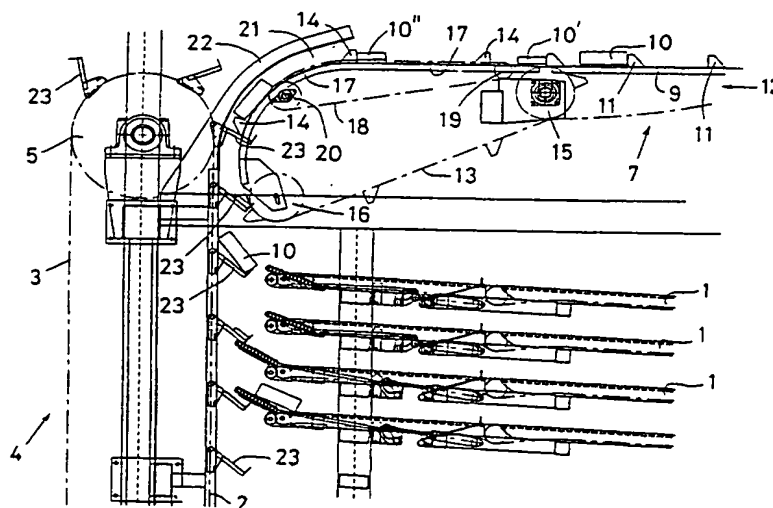
(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: FEEDING ARRANGEMENT FOR INDIVIDUAL FEEDING OF TIMBER PIECES



(57) Abstract: A feeder arrangement for the individual feeding of timber pieces (10) to a downwardly moving conveyor (2) includes an incoming conveyor (7) and projecting carriers (23) on the downwardly moving conveyor (2). The incoming conveyor (7) is disposed for the feeding of timber pieces (10). The carriers (23) incline obliquely downwards and outwards from the downwardly moving conveyor (2). A curved guide space (21) is disposed to overlap, with a lower end portion, an upper portion of the downwardly moving conveyor (2). The angle of curvature of the guide space (21) is so great that the upper side of a timber piece (10) which comes to guide space (21) will be turned to face downwards when the timber piece (10) rests on a carrier (23). The incoming conveyor (7) has an end portion which is turned to face towards the guide space (21) and which is approximately horizontal.

WO 01/19538 A1

FEEDING ARRANGEMENT FOR INDIVIDUAL FEEDING OF TIMBER PIECES

TECHNICAL FIELD

5

The present invention relates to a feeding arrangement for the individual feeding of timber pieces to a downwardly moving conveyor, and comprising an incoming conveyor for the supply of timber pieces and projecting carriers on the downwardly moving conveyor.

10

BACKGROUND ART

15

The present invention is intended to be applied in a plant for the sorting of individual timber pieces of different dimensions and/or qualities into a number of sorting compartments superposed over one another.

20

In prior art plants of the above-mentioned type, the individual sorting compartments are represented by approximately horizontal conveyors of a considerable length, of the order of magnitude of 50-100 m or possibly more. These conveyors are superposed over one another with a spacing of approximately 30-40 cm. The number of sorting compartments in the vertical direction may be large, often as many as 30-50 in number.

25

A downwardly moving conveyor runs along the infeed ends of the sorting compartments and conveys the individual timber pieces up to a given, predetermined sorting compartment where the timber piece is discharged by means of a transfer device and is fed into the selected sorting compartment.

30

Prior art plants have suffered from excessively low capacity, since the transfer of the individual timber pieces from the downwardly moving conveyor to each respective sorting compartment takes excessively long time.

In order to attempt to increase the capacity of the plant, the time available for infeed of each individual timber piece into a specific sorting compartment has been

increased. This has been realised by means of an increase of the linear transport length for each timber piece on the downwardly moving conveyor from the uppermost sorting compartment to the lowermost. In order to achieve this, the downwardly moving conveyor has been placed at an inclination in that the individual sorting compartments do not begin in a vertical plane, but in a plane which inclines to the vertical. This has been achieved in that an upper sorting compartment extends out beyond a subjacent sorting compartment. The downwardly moving conveyor follows the infeed ends of the sorting compartments and displays considerable inclination in relation to a vertical plane.

10

The downwardly moving conveyor has a number of chains on which the timber pieces lie flat with the longitudinal direction of the timber pieces approximately at right angles to the direction of movement of the chains. This implies that the timber pieces incline in the same manner as the chains, for which reason the front edges of the timber pieces, seen in the direction of movement, are constantly located on a lower level than their rear edges. This inclination of the timber pieces is highly advantageous, or even necessary, when the timber pieces are to be transferred from the downwardly moving conveyor to each respective sorting compartment.

For feeding the individual timber pieces to the downwardly moving, inclining conveyor, use has been made of a conveyor which moves approximately horizontally and in the same direction as the downwardly moving conveyor. The transfer between these two conveyors was put into effect in a quite simple manner.

The above-described arrangement with sorting compartments, where an upper sorting compartment extends with an end portion out beyond the end of a subjacent sorting compartment implies that the length of the lowermost and shortest sorting compartment is determined by the requirements on the capacity of the plant and that, as a result, all superjacent sorting compartments will, in principle, be unnecessarily long and costly and in which the uppermost sorting compartments will be far too long.

As an attempt to obviate the need for these excessively long sorting compartments, the objective is to place the infeed ends of the sorting compartments and the

downwardly moving conveyor in mutually parallel vertical planes. This requires that the downwardly moving conveyor be provided with projecting carriers which each are to carry a single timber piece. The previously known technique of feeding the downwardly moving conveyor cannot be employed in such a configuration.

5

PROBLEM STRUCTURE

The present invention has for its object to design the feeding arrangement intimated by way of introduction such that it can, with high capacity, feed a substantially vertical downwardly moving conveyor with projecting carriers, at the same time as the timber pieces carried by the carriers can be given an orientation which is favourable when the timber pieces are subsequently transferred to each respective sorting compartment. In particular, the present invention has for its object to design the arrangement according to the present invention such that it affords an extremely high work rate and a high level of operational reliability.

15

SOLUTION

The objects forming the basis of the present invention will be attained if the carriers incline obliquely downwards in a direction out from the downwardly moving conveyor, that a curved guide space defined by guide rails is disposed to overlap an upper region of the downwardly moving conveyor with a lower end portion, and that the angle of curvature of the guide space is so great that the upper side of a timber piece coming to the guide space will be turned downwards when the timber piece rests on a carrier.

20
25

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

The present invention will now be described in greater detail hereinbelow, with particular reference to the accompanying Drawings. In the accompanying Drawings:

30

Fig. 1 is a vertical side elevation of the infeed ends of an arrangement with mutually superposed sorting compartments, where the feeder

arrangement according to the present invention is located over the uppermost sorting compartment; and

Fig. 2 is a vertical side elevation of the arrangement according to the present invention in connection with the infeed ends of the uppermost sorting compartments.

DESCRIPTION OF PREFERRED EMBODIMENT

Fig. 1 shows a vertical side elevation of one end of a plant for sorting timber, so that the timber, after sorting, will be arranged according to timber dimensions and quality. The plant is based on a bearing structure of steel beams and, in the illustrated embodiment, has a height of approximately 20 m. The plant includes a number of sorting compartments, one for each timber dimension and quality, or possibly one for each range of dimensions or qualities. The sorting compartments are arranged superposed over one another, with a spacing in the vertical direction of 30-40 cm. Each sorting compartment includes a number of conveyors disposed at the same height and parallel with each other and carrying the timber pieces which lie only in one layer on each sorting compartment and which have their longitudinal direction horizontal and at right angles to the longitudinal directions of the conveyors and the sorting compartments, i.e. at right angles to the plane of the Drawing in Fig. 1.

In Fig. 1, reference numeral 1 relates to the above-mentioned sorting compartments, while reference numeral 2 relates to a downwardly moving part in a vertically running conveyor, while reference numeral 3 relates to an upwardly moving part in the above-mentioned conveyor. In its entirety, the conveyor, which may suitably be substantially vertical, carries reference numeral 4 and runs over an upper bending roller 5 and a lower bending roller 6.

The vertical conveyor carries the timber pieces from above and downwards for infeed of them into a specific sorting compartment 1. For feeding the timber pieces to the vertical conveyor, the plant displays an incoming conveyor 7 which is substantially horizontal, and which carries the timber pieces horizontally, with the

longitudinal direction at right angles to the direction of movement of the conveyor 7 and hence at right angles to the plane of the paper in Fig. 1.

For transferring the timber pieces carried on the incoming conveyor 7, the arrangement according to the present invention has a feeder device carrying the generic reference numeral 8.

Fig. 2 shows, on a larger scale, the feeder device 8 together with an upper region of the vertical conveyor 4 and the four uppermost sorting compartments 1.

10

The incoming conveyor 7 has at least one end portion which is turned to face the feeder device 8 and which is substantially horizontal. The incoming conveyor 7 includes carrier rails 9 on which the timber pieces 10 slide. Further, the incoming conveyor 7 includes drive chains, belts or the like which are provided with carriers 11 which shunt the individual timber pieces 10 ahead of them. The incoming conveyor 7 feeds the timber pieces 10 in a direction to the left in the Drawing, in accordance with the arrow 12.

In the region between the discharge end of the incoming conveyor 7 and the upper end of the vertical conveyor 4, there is disposed a synchronisation conveyor 13 with arrest members 14 which prevent individual timber pieces from moving to the left and downwards at a speed which is greater than the speed of the synchronisation conveyor 13. The synchronisation conveyor runs synchronously with the vertical conveyor 4 in the sense that an arrest member 14 must always coincide in terms of movement with a carrier 23 on the vertical conveyor 4 (as will be described in greater detail below). It is clearly apparent from the Figure how the timber pieces 10 abuts against the arrest members 14 with their front edges seen in the direction of movement. It will further be apparent that an upper region of the downwardly moving part 2 in the vertical conveyor 4 overlaps with a lower portion of the synchronisation conveyor 13, and it is in this region that the movements of the arrest members 14 and the carriers 23 are to coincide.

30

The path of the synchronisation conveyor 13 is determined by the two bending rollers 15 and 16, as well as by a guide rail 17 which has a straight and

approximately horizontal portion facing towards the incoming conveyor 7 and an arched downward portion which is directed towards the vertical conveyor 4 and which overlaps partly with it. The arched portion is approximately in the form of an arc and of an extent in the circumferential direction of approximately 90° or slightly more.

For transferring the individual timber pieces 10 from those positions they assume when they depart from the incoming conveyor 7 to those positions they assume with their front edges abutting against the arrest members 14 on the synchronisation conveyor 13, the arrangement according to the present invention includes a drive means with a circulating belt 18, a chain or the like. The belt 18 runs over the two bending rollers 19 and 20 and is located with its upper part slightly above the upper surface of the guide rail 17 so that the timber pieces, by friction co-operation with the belt 18, are advanced by it. The belt 18 runs with greater linear speed than that which applies to the synchronisation conveyor 13 so that the timber piece 10' along the horizontal section of the guide rail 17 is accelerated to a position which corresponds to the timber piece 10" where it subsequently follows the arrest member 14 at that speed which is defined by the synchronisation conveyor.

On the outside of the guide rail 17, there is a guide space 21 through which the timber pieces pass. The guide space 21 is defined outwardly and upwardly by an outer guide rail 22 which, at least to a part of its (approximately one quarter of a turn) length, runs approximately parallel with the curved section of the inner guide rail 17. It will be clearly apparent from the Figure how the individual carriers 23 disposed on the vertical conveyor 4 extend straight through the guide space 21.

The outer guide rail 22 has a lower end portion which may be seen as an upward extension of the vertical conveyor 4.

As was mentioned above, the inner guide rail 17 is of an extent which preferably somewhat exceeds 90°. This implies that if the upper, straight section of the guide rail 17 is horizontal, its lower end (the discharge end) will diverge somewhat away from the vertical conveyor 4 in a downward direction. Between the lower end region of the inner guide rail 17 and the vertical conveyor 4, the guide space 21 will, as a

result, have a downwardly cuneiformly flaring section which is downwardly defined by a carrier 23 passing therethrough. It is in this region that the deposition of a timber piece from an arrest member 14 to a carrier 23 is completed.

- 5 It will further be apparent from the Figure that the carriers 23 incline obliquely downwards in a direction out from the downwardly moving part 2 in the vertical conveyor 4. Hereby, the carriers 23 will approximately form tangents to the bending curve of the guide space 21 when the carrier departs from the guide space. The curvature of the guide space 21 is so great that the upper side of a timber piece which
10 is fed to the guide rail 17 will be turned to face downwards when the same timber piece rests on a carrier 23.

- It was mentioned above that the synchronisation conveyor 13 in a sense ran synchronously with the vertical conveyor 4. However, the synchronisation conveyor
15 13 moves at greater linear speed than the carriers 23. Further, the distances between adjacent arrest members 14 is greater than between adjacent carriers 23. The synchronisation resides in the fact that a timber piece whose position in the guide space 21 is defined by an arrest member 14 is to come into contact with a carrier 23 located in the guide space, at the same position in the guide space, namely
20 approximately where the width of the guide space begins to increase in a downward direction. Further, the arrest member 14 should have wholly passed the carrier 23 so that the timber piece rests entirely on the carrier when this departs from the guide space and the arrest member 14 begins to be angled away at the bending roller 16.

WHAT IS CLAIMED IS:

1. A feeding arrangement for the individual feeding of timber pieces (10) to a downwardly moving conveyor (2), comprising an incoming conveyor (7) for the supply of timber pieces and projecting carriers (23) on the downwardly moving conveyor, **characterised in that** the carriers (23) incline obliquely downwards in a direction out from the downwardly moving conveyor (2); that a curved guide space (21) defined by guide rails (17, 22) is disposed to overlap an upper region of the downwardly moving conveyor (2) with a lower end portion; and that the angle of curvature of the guide space is so great that the upper side of a timber piece (10) coming to the guide space will be turned downwards when the timber piece rests on a carrier.
2. The feeder arrangement as claimed in Claim 1, **characterised in that** the incoming conveyor (7) has an end portion facing towards the guide space (21) which is approximately horizontal; and that, the guide space has an angle of curvature downwards which is approximately 90° or greater.
3. The feeder arrangement as claimed in Claim 1 or 2, **characterised by a** synchronisation conveyor (13) which extends from the discharge end of the incoming conveyor (7) and through the guide space (21), said synchronisation conveyor having arrest members (14) against which rest the front edges of the timber pieces (10) in the direction of movement.
4. The feeder arrangement as claimed in Claim 3, **characterised in that** drive means (18) is disposed along at least a part of the path of the synchronisation conveyor (13), said drive means being operative to act on the timber pieces (10) at a speed which is greater than the speed of the synchronisation conveyor.
5. The feeder arrangement as claimed in any of Claims 1 to 4, **characterised in that** the carriers (23) have a longitudinal direction which approximately forms a tangent with the curving path of the guide space (21) when the carrier departs from the guide space.

6. The feeder arrangement as claimed in Claim 4 or 5, characterised in that said drive means (18) includes a circulating belt on which rest the timber pieces (10).

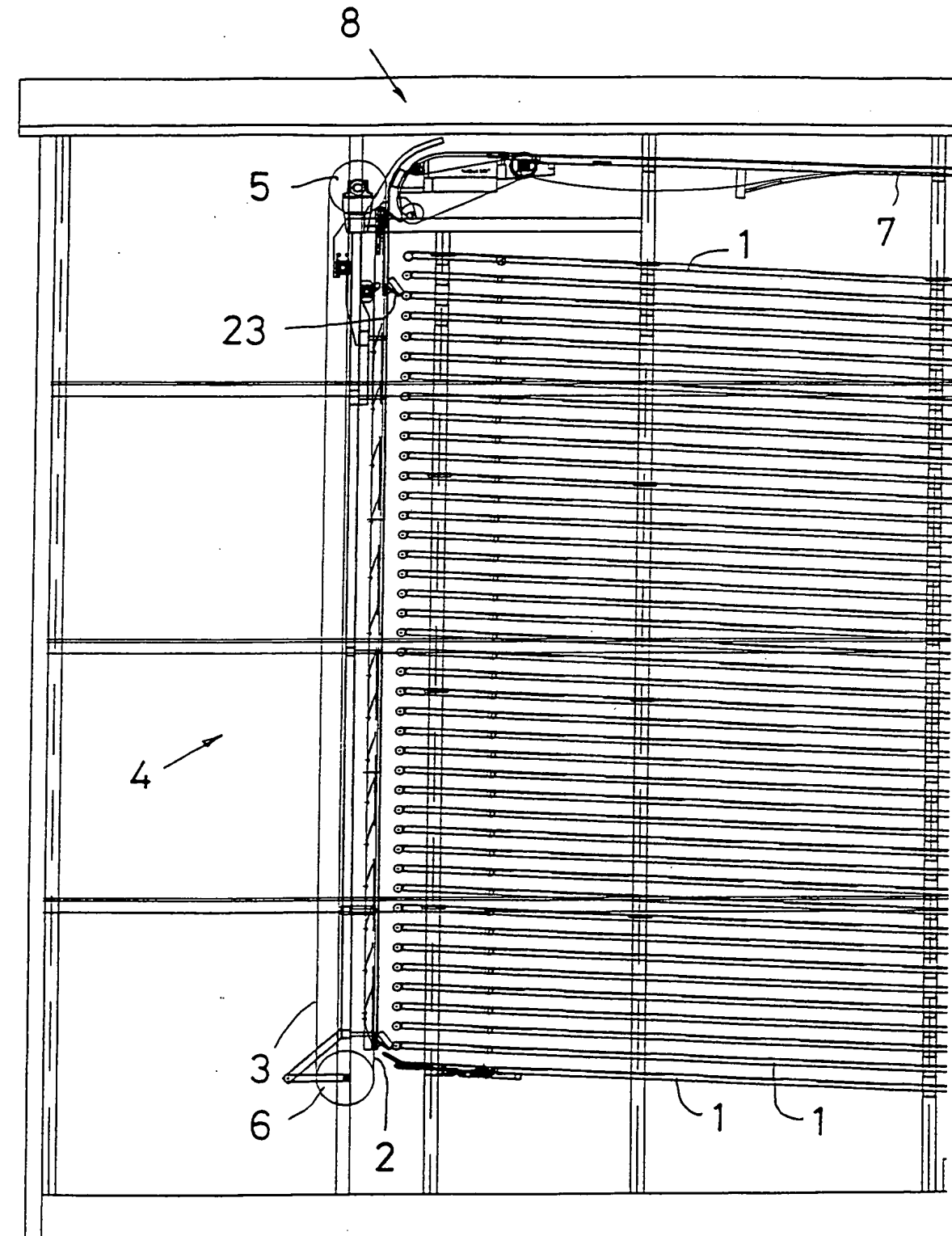


Fig 1

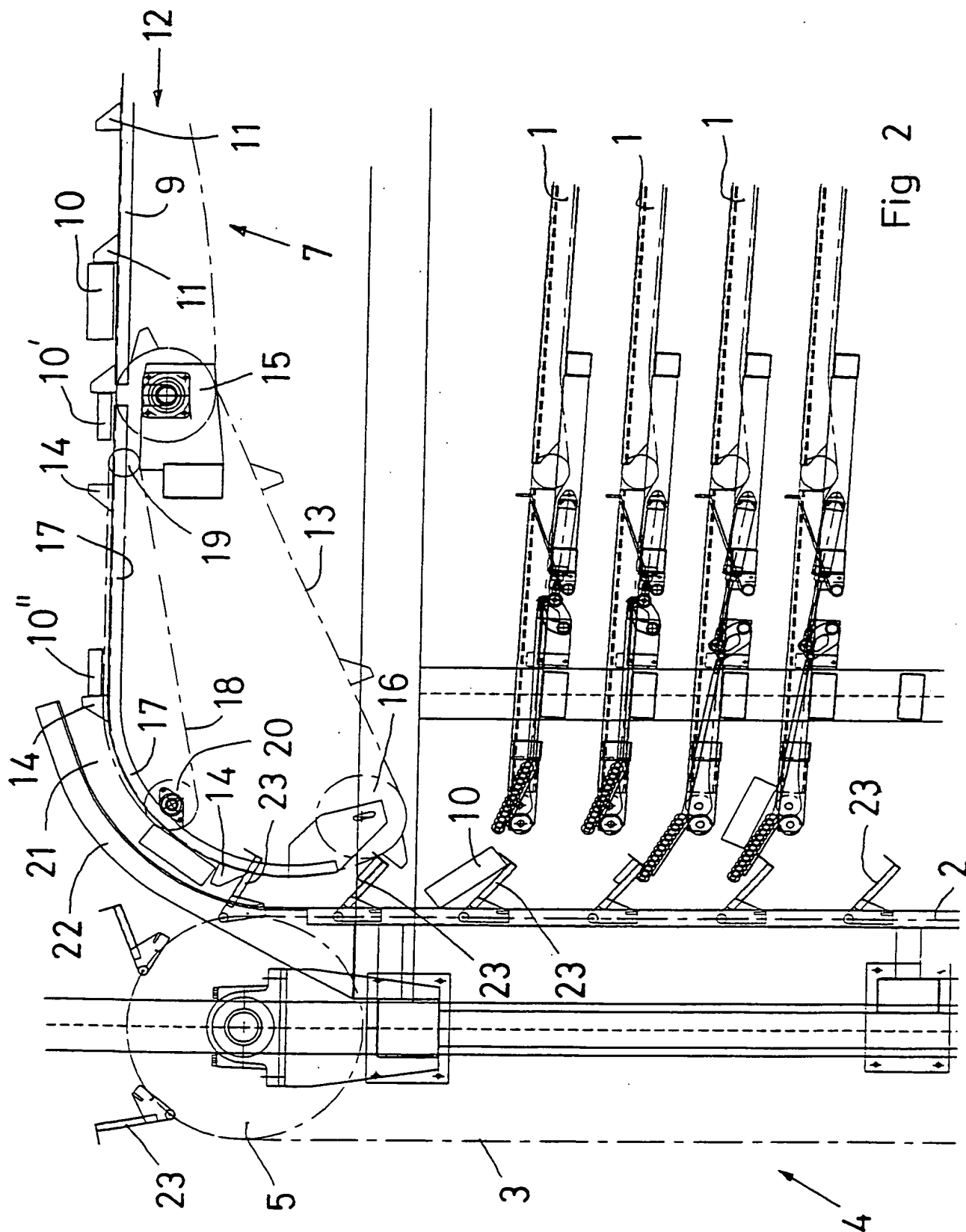


Fig 2